

UNITED STATES PATENT OFFICE.

GIOVANNI CASELLI, OF FLORENCE, ITALY.

IMPROVED PANTOGRAPHIC TELEGRAPH.

Specification forming part of Letters Patent No. 20,698, dated June 29, 1858.

To all whom it may concern:

Be it known that I, GIOVANNI CASELLI, of Florence, in the Kingdom of Italy, have invented new and useful Improvements in Electric Telegraphs, which improved telegraph I call the "Pantographic Telegraph," of which the following is a specification.

The nature of my invention consists in the production and transmission with the greatest possible rapidity of fac-similes of writings and drawings by sending and receiving at the same time several dispatches by a single wire, and without effecting any change in the arrangement of the telegraphic lines already in existence.

As one of the chief advantages of my telegraph lies in the rapidity with which dispatches can be received and transmitted, I hasten to state that this rapidity can be increased, as we shall see later, in the ratio of the dimensions which it is proposed to give to the telegraphic machines.

The following is a full description, reference being had to the accompanying drawings.

A B C D, a cast-iron stand of a pyramidal form, supports a metallic pendulum, *a b c d*, of the length of one hundred and forty centimeters. It is suspended by a horizontal axis, of which the two extremities are cylindrical, and which rests on four wheels of equal diameter. Figure III represents the cast-iron stand, seen laterally.

At the lower extremity of the pendulum there is fixed at right angles an electro-magnet, *d'*, having the form of a rectangular parallelepiped, as is more clearly seen in Fig. IV, as well as in Fig. V, representing the same pendulum where viewed laterally.

Two pieces, *e e'*, thoroughly welded, are of forged iron, destined to serve as armature on the electro-magnet *d'*. They are solidly fixed on the sides of the base of the stand A B C D, as is also seen in Fig. VIII, representing the plan of the machine.

Fig. VII represents an electro-magnetic apparatus, which I shall term "interrupter of the line," and of which we shall presently see the action.

B' is a voltaic pile of Bunsen, of which the circuit is formed by a copper wire. (Represented in the drawings by a dotted line.)

In proceeding to examine the direction to

be taken by the current of this pile of Bunsen, we perceive that, starting from the positive pole, it enters the machine by the screw-button No. 5, comes out by the button No. 6, passes by the interrupter of the line, Fig. VII, returns to the machine by the button No. 7, traverses along the pendulum, the dotted wire, which, after coiling spirally round the electro-magnet *d'*, reascends the same pendulum as far as the point *s*, to which it is joined by a spiral wire, and after having traversed the mercury which is in the basin *u'*, arrives at the screw-button No. 4 and returns to Bunsen's pile B'. The electric current of this pile having thus magnetized the piece of iron *d'*, which is at the extremity of the pendulum, the latter is retained by the armature *e*, but it is unable to touch it, from its being covered with a layer of caoutchouc.

In order to interrupt the current of the pile B', which I shall call the "local pile," there is employed (as we shall see) the current of the telegraphic line, proceeding from the battery D'. Before examining the direction taken by the current of this battery, let us fix for a moment our attention on the other pieces of the telegraphic machine.

A stand of cast-iron, L L, supports two parallel cylinders, one, *f f*, is visible in the first figure, and the position of the other, *f' f'*, may be observed in Fig. VIII, which represents the ground plan of the machine. A horizontal metallic rod, *o o*, bent at right angles at *c* and *d'*, and jointed at the point *c'*, must in consequence follow the movements of the pendulum. It is supported by the vertical rod *s u*, in such a way that its extremity *x'* traverses a straight horizontal line, while the pendulum oscillates and the point *c'* describes the arcs of a circle. The other rod, *o' o'*, also traverses with its extremity *x'* a horizontal line. Now, if we suppose that the current of the electro-telegraphic battery D' leaves the pole *d* we shall see that it arrives by means of the copper wire (represented in the drawings by red lines at the knob or button No. 2 of the machine, Fig. 1) and reaches the point *n*, where the said wire branches off in lines. The one of these two branches which descends as far as the cylinder *f f*, which is isolated, can afford no passage to the current, which by the other branch will be conducted to the point 2 at the cup *a*, filled